

Claims

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1. A method for coupling a first shaft provided with a flange having a through bore and a second shaft provided with a flange having a blind bore aligned with the through bore in the flange of the first shaft, said method comprising:

(a) providing a coupling device including an adapting bolt having an external tapered surface and an axial hole open at the narrower end of the adapting bolt and a cylindrical sleeve element having an internal tapered surface corresponding to the external tapered surface of the adapting bolt, the adapting bolt being within the sleeve element,

(b) fitting the coupling device in the aligned bores so that the narrower end of the adapting bolt is toward the flange of the first shaft and an end surface of the sleeve element is exposed,

(c) fitting a tool in the axial hole in the adapting bolt, and

(d) applying a force to the tool tending to displace the adapting bolt relative to the sleeve element in the direction from the wider end of the adapting bolt toward the narrower end thereof.

2. A method according to claim 1, further comprising, between step (a) and step (b), installing an end piece in the aligned bores ahead of the coupling device for use in applying a force tending to displace the adapting bolt relative to the sleeve element in the direction from the narrower end of the adapting bolt toward the wider end thereof.

3. A method according to claim 2, wherein the axial hole in the adapting bolt is a through hole and the end piece is formed with an internally threaded hole aligned with the through hole in the adapting bolt and the method further comprises, after step (c), the additional step of releasing the coupling of the first and second shafts by inserting a screw bolt into the through hole in the adapting bolt, holding the end piece against rotation relative to the adapting bolt, and rotating the screw

bolt relative to the adapting bolt in a direction to bring the screw bolt into threaded engagement with the hole in the end piece and force the adapting bolt relative to the sleeve element in the direction from the wider end of the adapting bolt toward the narrower end thereof.

4. A method according to claim 1, wherein the axial hole in the adapting bolt is internally threaded and the tool fitted in step (c) is a hydraulic tool which comprises a cylindrical supporting sleeve engaging the sleeve element, a piston member hydraulically moveable with respect to the supporting sleeve, and an externally threaded piston rod coupled to the piston member and in threaded engagement with the adapting bolt.

5. A method according to claim 1, wherein the axial hole in the adapting bolt is internally threaded and the tool fitted in step (c) is a mechanical tool which comprises a support piece engaging the sleeve element and an externally threaded screw bolt extending through the support piece and in threaded engagement with the hole in the adapting bolt.

Sub A₂ 6. An article of manufacture comprising:
 a first shaft provided with a flange having a through bore,
 a second shaft provided with a flange having a blind bore
 aligned with the through bore in the flange of the first shaft,
 a coupling device including an adapting bolt having an external tapered surface and an axial hole open at the narrower end of the adapting bolt and a cylindrical sleeve element having an internal tapered surface corresponding to the external tapered surface of the adapting bolt, the adapting bolt being within the sleeve element and the coupling device being located in the aligned bores so that the narrower end of the adapting bolt is toward the flange of the first shaft and an end surface of the sleeve element is exposed through the bore in the flange of the first shaft, and

a means for engaging the adapting bolt at the axial hole and applying a force tending to displace the adapting bolt relative

to the sleeve element in the direction from the wider end of the adapting bolt toward the narrower end thereof.

1. An article according to claim 1, wherein the axial hole in the adapting bolt is internally threaded and the means for engaging the adapting bolt is a threaded member for threaded engagement with the adapting bolt.

2. An article according to claim 1, wherein the adapting bolt is shorter than the combined thickness of the flanges and the adapting bolt is tapered over its entire length.

3. An article according to claim 1, wherein the adapting bolt and the sleeve element are of substantially equal length.

10. An article according to claim 6, further comprising a separate end piece in the second bore and having an annular abutment shoulder for engaging the sleeve element and surrounding a recess for receiving the adapting bolt with a clearance fit, whereby the adapting bolt can be moved relative to the sleeve element in the direction from the narrower end of the adapting bolt toward the wider end thereof without interference from the end piece.

4. An article according to claim 10, wherein the axial hole in the adapting bolt is a through hole and the end piece is formed with a hole aligned with the axial through hole in the adapting bolt, the hole in the end piece being threaded for engaging a tool for releasing the coupling.

5. An article according to claim 4, comprising a means for preventing turning of the end piece relative to the adapting bolt.

6. An article according to claim 10, comprising a means for preventing turning of the end piece relative to the adapting bolt.

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